New York State Department of Transportation
Office of Engineering

OPERATIONAL PLAN
SFY 2002-2003 and Beyond

Quality
People

Quality
Service

Technical Services

Geotechnical Engineering
Highway Data Services
Materials
Transportation Research

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TECHNICAL SERVICES DIVISION

OPERATIONAL PLAN FOR SFY 2002/2003

Introduction

The Technical Services Division's Operational Plan contains accomplishments for SFY 2001/02, and the priorities, issues and goals for the program for SFY 2002/03 and beyond.

The Technical Services program provides materials and geotechnical engineering services, data services and targeted transportation research to the Department through:

- the development and management of numerous quality assurance programs.
- a subsurface exploration program, which analyzes soil and develops foundation recommendations.
- the development and implementation of engineering policies, standards and specifications.
- the management of engineering research utilizing internal and external resources.
- the collection and dissemination of highway data on the inventory, condition, and use of the State Highway System.

These services are provided through the Materials, Geotechnical Engineering, Highway Data Services, and Transportation Research and Development Bureaus in the Central Office in conjunction with Technical Services, Materials, and Geotechnical Engineering in the Regions. The Technical Services program is founded on a multi-million dollar investment in tangible assets of laboratories and equipment in both the Central Office and the Regions. These assets are utilized by a well trained and dedicated staff. There are 250 employees in the Central Office and more than 300 Regional counterparts. In the Regions, the program receives its staff through the Design, Construction and Planning program budgets.

The program serves all elements of the Department as well as some external clients because of the program units' expertise and facilities. The services provided directly support the planning and implementation of the Department's capital and maintenance programs, and thus impact the expenditure of several billion dollars each year.

The strength of the Technical Services Division is our people. We are a Division of experts in chemistry, geology, pavement design, materials, data services, structural engineering, geosynthetics, foundation engineering, material behavior, physical testing, decision sciences, quality assurance techniques, and many other disciplines. In the following pages, our joint accomplishments over the past year are documented and Division goals are established for the coming year. That we were able to get so much done is a tribute to those who work in this Division and our counterparts in the Regions.

NYSDOT
Library
50 Wolf Road, POD 34
Albany, New York 12232

QUALITY SERVICES

The Division takes justifiable pride in its accomplishments, both in terms of operational production and continuous improvement achievements.

A sampling of the Division's production activities follows:

NUMBER	ACTIVITY
1,626	Department employees trained by the Materials Bureau
1,350	Department employees trained by the Geotechnical Engineering Bureau
128	Court cases in which Photolog prints were utilized as evidence
65,070	Kilometers of State highway inventoried and condition scored
4,363	Transactions by Research Library
3	Research Newsletters
1,264	Soil Sample Identification Tests
95	Bridge Foundation Designs
14,650	Kilometers of highway filmed via Photolog, 3,628 Photolog prints sold
300	Evaluations of Materials, Plants, Facilities, Sources and Products
36	Soil Consolidation Tests
64	Wall Designs
55	Geologic Survey & Analysis of Rock Cut Slopes
6,000	"Short" traffic counts taken on 5,500 locations around the state
440	Vehicle classification counts processed
200	Public Inquiries for highway data answered
1,600	Municipalities contacted to update the Local Highway inventory
108	Materials Project Level Design Consultations
632	General Roadway Inspections
61	Revisions to Geotechnical Specifications & Standards
32	Materials QA Procedures developed/revised
74,322	Material Tests completed on 22,174 samples
9	Technical Services Publications produced
3	Contract Research Assignments Executed
2,324	Geosynthetic Tests completed
7,196	Granular Material Soil Tests
26	Roadway Foundation Designs
175	Materials Construction Evaluations
164	Soil Strength Tests
2,236	Topsoil Tests
20	Papers published by Transportation Research Board or others forums
2	Department sponsored NCHRP Research Projects approved for funding
63	Materials Standard Specifications developed
4,502	Falling Weight Deflectometer tests
2,733	Car Pool Vehicle requests filled

The following are examples of our continuous improvement activities:

DRILLING SERVICES PROVIDED

During 2001, Main Office drill supervisors augmented the capabilities of Regional drill crews on several high profile projects such as I-86, Route 219, and the Roslyn Viaduct. Geotechnical Engineering also provided drilling services on two other projects requiring immediate results. Following a tragic accident that damaged the Route 58 bridge over the Oswegatchie River in St. Lawrence county, the planned bridge replacement project for this structure was accelerated. Main Office drill supervisors assisted the Region 7 drill staff to obtain the necessary subsurface information in two days. This schedule was necessary so that demolition and removal of the failed structure could proceed.

Drill Supervisors were also requested to investigate a frost heave problem under the newly reconstructed Utica Parkway. Seven continuously sampled holes were progressed to determine the cause and location of frost which was creating a rough ride in the new pavement. Rapid investigation was required because of the seasonal nature of frost heaves and to address the public's concern with this premature pavement problem.

USE OF RECYCLED PLASTICS FOR NOISE BARRIERS

The Transportation Research and Development Bureau assisted in the construction of a noise barrier using recycled plastic lumber on Route 17 near Binghamton. Noise barriers are constructed along highways to minimize the effects of traffic noise on adjacent communities. The Route 17 project represented the third plastic noise wall constructed in New York. Previously plastic noise walls were built near Exit 49 of the Long Island Expressway and on the Route 49 Expressway in the Town of Marcy.

Completion of the Route 17 project brings the total usage of recycled plastic materials for noise barrier applications to 160 metric tons. This places New York among the leading states in the nation in this type of environmentally friendly recycling project. The standards and material specifications used for these projects were based on previous research completed by the Transportation Research and Development Bureau.

WALL EVALUATIONS

In a joint effort with Region 1, field engineers from Geotechnical Engineering inspected and evaluated 48 laid up stone walls in the Adirondack Park. These walls were built in the early 1930's. Their parapets had deteriorated and in some cases had been replaced using temporary concrete barrier. For aesthetical reasons, it was desirable to replace the concrete barriers with a more scenic alternative. The team spent a few weeks in the field, inspecting, photographing, and evaluating the walls before categorizing them for future action. A unique rating system was developed to analyze them. Remedial actions were detailed and have been included in a planned repair project.

UPDATED PAVEMENT SPECIFICATIONS

The Materials Bureau completed major revisions to the Standard Specifications during 2001. Section 402 - Hot Mix Asphalt Pavements, has been modified to include the new Superpave pay items. These items were formerly special specifications. Section 403 has been updated and has retained reference to Marshall mix designs for use by towns, counties, and municipalities.

The Materials Bureau also completed major revisions to Section 502 - Portland Cement Concrete (PCC) Pavement. This section has been updated to reflect the latest construction methods for PCC pavements. The authors also modified Section 502's existing smoothness requirements, by adding incentive and disincentive pay items. All of these new pavement specifications were completed in time to become effective with the issuance of the new 2002 Standard Specification book.

PATROON ISLAND BRIDGE FATIGUE ANALYSIS

The Transportation Research and Development Bureau, at the request of the Structures Division, completed a major field evaluation which estimated the remaining steel fatigue life of the Patroon Island Bridge. This bridge carries I-90 over the Hudson River near Albany, N.Y. The project was initiated to provide the Department with vital planning information to help decide the bridge's future. The bridge was instrumented with strain gauges at various locations and strain data was collected. The data was analyzed and the steel's remaining fatigue life was estimated. This research potentially saved tax payers millions of dollars by determining the Patroon Island bridge had many years of useful service ahead of it. A presentation detailing the research was given at Engineer's Week 2002.

AUTOMATIC HAMMERS FOR DRILL RIGS

The subsurface investigation program from Geotechnical Engineering has made significant safety advances with the purchase, installation, and evaluation of automatic hammers for the Department's drill rigs. These new type hammers offer several advantages over existing systems. The hammers are safer to operate by eliminating the operator's exposure to striking parts. They also provide an extremely consistent energy per blow and reduce operator fatigue, especially in firmer soils when blow counts increase to advance the sampler.

Geotechnical Engineering purchased 23 automatic hammers for all of the Department's modern drill rigs. Bureau Staff installed the hammers using work space donated by Regional Equipment Management. Engineering staff evaluated the efficiency of the hammers against our existing systems, using pile driving equipment and an instrumented drill rod. This helped ensure that blow count information obtained with the new hammers will be properly utilized in future foundation analyses.

CONTINUED DEVELOPMENT OF A PAVEMENT MANAGEMENT SYSTEM

The Department developed a pavement management system in the late 1980s based on pavement surface condition surveys. This system is still effective and functional and is used to provide network level assessments of pavement conditions, and to help each Region develop their capital program. The Pavement Management Services Unit is working to further develop and update the existing system to take advantage of advances in technology for data collection and analysis, such as:

Expansion of IRI Data Collection

In 2001, pavement roughness data was collected in the form of the International Roughness Index (IRI) on the entire Touring Route and most Reference Routes. This information is being provided to managers as a factor in identifying needs and prioritizing projects for the pavement program. The Pavement Management Services Unit is continuing to help Regions understand IRI concepts and available data, and to develop additional ways to use the information to manage pavements.

"Paperless" Sufficiency Scoring

The current sufficiency scoring process is paper based, with updates to the pavement scores and changes to the sufficiency file information collected in the field by hand (on paper) and then keypunched into the system. Over the past year, the Pavement Management Services Unit investigated two different technologies to collect data linked with GPS units. Work continues on developing a prototype system and a pilot project is expected in 2002.

Photolog Digitization Project

The first phase of the digital conversion project for scanning the last cycle of photolog images is approximately 30% complete, with film from about 20 counties converted to a digital format. Work by a contract vendor continues to add about 2 counties per month to the digital system. Network and data storage issues have been addressed and images from selected counties are available for viewing on desktop PCs.

Approval was granted by the IT Council to complete the remaining conversion to digital photolog by obtaining the necessary equipment to perform direct digital capture of high resolution images. The new digital system will capture a forward and side view for each image taken. A totally digital photolog system is expected to be in place starting in the spring of 2003.

CONSTRUCTING LONGITUDINAL JOINTS IN CONCRETE PAVEMENTS

When the Department presently constructs concrete pavements using slip forming methods, adjacent lanes are connected together using two piece longitudinal joint ties. To begin the process, a female tie bar is inserted into the plastic concrete, at the edge of the lane. Before paving the next lane, the male component is added to establish load transfer. The practice of using two piece joint ties has the potential for future corrosion at the treaded connection between lanes and can adversely affect pavement smoothness at each location reinforcing steel is inserted into plastic concrete.

To eliminate corrosion and smoothness issues, Transportation Research proposed connecting adjacent lanes of concrete pavement using one piece joint ties, drilling and anchoring them into hardened concrete. Results of laboratory analysis showed the grouted rebars yielded before they debonded from their holes. This new method of constructing longitudinal joints was implemented on I-490 in Rochester. Since it was possible to reduce the length of reinforcing steel using one piece joint ties, 22% less steel was used to connect the lanes together, along with improved pavement smoothness and reduced corrosion susceptibility.

REVISED MATERIALS INSPECTION MANUAL

The Materials Bureau completed Division Goal 01-11 by revising and updating the Materials Inspection Manual (MIM). MIM was previously updated in 1989. MIM is a key tool in the Department's Quality Assurance Program, used by construction personnel to determine the acceptability of materials arriving at a project site. This manual is also used by Department inspectors to determine the acceptability of component materials prior to their arriving at a project. The Materials Bureau intends to make the new MIM available on the Division's website and plans to update it quarterly.

RECYCLING

Following the successful use of tire shreds as light weight embankment material on a project in Region 9, and with increasing pressure to beneficially use waste tires from stockpiles, last year the Geotechnical Engineering Bureau issued a directive that tire shreds will be the Department's first choice for lightweight fill applications. Since tires from old stockpiles are frequently too contaminated for other uses, shredding them for light weight fill applications is often the only affordable use which can recycle appreciable numbers of them. Taking advantage of their light weight also makes tires more competitive in price compared to traditional lightweight fills, which can cost ten times as much as ordinary embankment material.

ACOUSTIC SENSOR TECHNOLOGY

The Traffic Monitoring Unit of the Highway Data Services Bureau is currently operating two mobile traffic monitoring platforms. These platforms were conceived and constructed in-house by Bureau personnel to support non-intrusive acoustic sensor technology with applications in traffic data collection and Intelligent Transportation Systems activities. With safety as the initial priority, this technology greatly reduces personnel exposure to traffic. The system is not only meeting the needs of the Department, but overall performance and accuracy is proving greater than traditional tube-based counts for use in high volume, multi-lane traffic conditions. Two additional platforms will be completed soon and deployed.

COMPOSITE PILE SYSTEMS

The Geotechnical Engineering Bureau, in cooperation with the Empire State Development Corporation, Brooklyn Polytechnic Institute, the Port Authority of New York and New Jersey, and the Federal Highway Administration, is investigating the installation and practical applications for composite piles. These new type of piles are made from non-traditional materials such as fiberglass and recycled plastic. They sometimes can be combined with more traditional materials like concrete and steel. Composite piles have been instrumented, driven, and analyzed at two sites to date. One project was completed for the Port Authority in New Jersey and the other was a Department wetland mitigation project at Swindler's Cove in Region 11. Composite piles offer the promise of longevity in difficult environmental conditions such as salt water harbors and also provide new markets for recycled waste plastics.

APPENDIX A

DIVISIONAL GOAL STATEMENTS
for 2002/2003

Geotechnical Engineering Bureau

- 02-1* Beneficial Use of Waste Tires in Earthwork
- 02-2 Rock Core Log Development
- 02-3 Develop Operational Procedures for Spectral Analysis of Surface Waves

Highway Data Services Bureau

- 02-4 Highway Functional Classification Mapping
- 02-5 Department-wide Access to Digital Photolog Files
- 02-6* Highway Data Management System (Phase II)

Transportation Research and Development Bureau

- 02-7 Policy and Procedure Manual, Research Oversight Functions

Materials Bureau

- 02-8* Precast Concrete QC/QA (Implementation)
- 02-9* Develop a Ride Quality Specification for Hot Mix Asphalt Pavements
- 02-10* Pavement Marking Material Guidelines
- 02-11* Revise the Bureau's Quality Assurance Program to optimize resources.

* denotes new goal for 2002

Technical Services Division
GOAL STATEMENT

Goal Name: 02-1 Beneficial Use of Waste Tires in Earthwork, Implementation Plan

As Is: There are an estimated 20 million waste tires in tire dumps throughout New York. Although NYSDOT has identified several beneficial uses of these tires in earthwork construction, no process exists for identifying potential opportunities of using waste tires in specific projects.

Desired State: Have in place established procedures for reviewing projects in the design stage to identify opportunities for and costs of beneficial uses of waste tires in earthwork construction.

Team Leader: Don Dwyer

Team: Todd Dickson, Jeanne Hewitt, EAB.

Specific Goal for SFY 2002-2003: Review current beneficial uses of waste tires in earthwork construction and consider additional uses. Develop cost factors applicable to each identified beneficial use. Develop a process to identify projects with potential beneficial uses in earthwork. Provide project designers with estimated quantity of tires, cost, and comparison of cost of beneficial use of tires to cost of using traditional materials.

Rationale: Recently, fires have erupted in several tire dumps in New York, resulting in uncontrolled burning of several million tires. These fires cause immediate health and safety problems, and initiated discussions at several state agencies and the legislature on strategies for rehabilitating illegal tire dumps, including mandating scrap tire usage in construction. NYSDOT has identified several beneficial uses of waste tires, some more cost-effective than others. However, NYSDOT has no mechanism to systematically review projects for potential beneficial uses of waste tires. This plan implements a review process for earthwork construction.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-2 Rock Core Log Development

As Is: Rock cores are frequently inspected by the Department's Engineering Geologists for design and construction purposes. Certain information is gathered from these inspections and used to develop rock parameters. This basic information is not routinely captured along with the other data recorded in the subsurface exploration logs.

Desired State: Basic information about the rock core is captured for posterity and kept with the rest of the information about that subsurface exploration.

Team Leader: Priscilla Duskin

Team: L. David Suits, Phillip Walton

Specific Goal for SFY 02-03: Develop a rock core log with a format similar to that of other portions of the subsurface exploration log. Include basic information which is central to any examination of a core by the Department's Engineering Geologist: rock type, recovery, fracturing, RQD, hardness, weathering, etc. Reach a consensus among users as to the proper content and format and implement its use.

Rationale: Basic information on rock cores is being gathered and not captured along with the other information from subsurface exploration. This information could be useful to other geologists, designers, and bidders. It could be archived and retrieved many years from now when a new project is initiated in the same area. It could be used to improve the quality of generalized bedrock mapping or the knowledge about a particular area of bedrock.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-3 Develop Operational Procedures for Spectral Analysis of Surface Waves (SASW)

As Is: The classification of seismic Soil Profile Types is based on evaluation of spoon blow counts and visual description of soil samples obtained from a site.

Desired State: Attain proficiency in performing field tests and analyzing results for:
a) classifying Soil Profile Type;
b) developing soil shear wave velocity profile for site-specific ground response analysis.

Team Leader: Teh Sung

Team: Makbul Hossain, Priscilla Duskin

Support: GEB's Pavement Design Services Group and Hydro-Geophysical Unit.

Specific Goals for SFY 02-03:
1. Receive training from the manufacturer on field operations and data analysis;
2. Perform acceptance testing of the equipment and software;
3. Develop a draft Operations Manual.

Rationale: One of the new seismic design criteria set forth by the Structures Division for "downstate" bridges requires that GEB classify the soil profile at every bridge site to a depth of 30 m in accordance with the latest seismic provisions of the National Earthquake Hazard Reduction Program (NEHRP). Using the soil information obtained from SASW testing would result in a more accurate Soil Profile Type and also a more accurate ground response analysis than that based upon the more conventional soil parameters such as SPT blow count or undrained shear strength. This will reduce the need for making overly-conservative design assumptions, which translates into cost savings.

The spectral analysis of surface waves (SASW) is based on the principle that the various wavelength components in an impact-generated surface wave penetrate to different depths in the soil layers. It is an economical and reliable geophysical field test method to determine material properties of subsurface soil layers.

SASW testing is also an excellent tool to evaluate pavement layer thicknesses, pavement material properties (including the stiffness profiles of the pavement structure) and segregation in concrete and asphalt pavements.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-4 Highway Functional Classification Mapping

As Is: Functional class mapping is a by-product of a more inclusive effort to make data for the entire Federal Aid System accessible through GIS. Thus far, the highway data files for the entire state system and the non-state Federal Aid highways for Regions 1, 6, and 7 can be accessed through GIS. For the remaining Regions, the only available maps showing functional classification are photocopies of maps from 1980 with hand-drawn edits to reflect the 1990 Census-based changes.

Desired State: A full integration of the highway data files with the map-based GIS representation for the entire Federal Aid System and a complete set of GIS-based functional classification/Federal Aid System maps for the entire state.

Team Leader: Jim Cerqua

Team: To be announced.

Specific Goal for SFY 02-03: Complete the project before the Urbanized Area Updates are received from the 2000 Census (anticipated to be around April, 2002).

Rationale: The decennial Census typically results in an update to the functional classification system three years later. By completing the mapping project prior to 2003, new maps can be produced simply by changing the functional class designations on the highway files and printing new maps. Without this GIS-based tool, hundreds of new maps will need to be prepared cartographically (hand drawn, chart taped).

In addition, complete knowledge of the entire Federal Aid System (as opposed to just the state system) is becoming increasingly important in the day-to-day operations of the transportation community. Under TEA-21, in particular, federal funding availability is also dependent on the availability of good, non-state system data as well as state system data. The effort to make the highway data files consistent with and accessible through GIS will be paid back many times through the increased analytical capability and reduced staff time to access data in the future.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-5 Department-wide Access to Digital Photolog Files

As Is: The photolog is a valuable tool used by many Department managers, designers, claims attorneys, and the public to view design project sites, pavement deterioration, pavement or roadside conditions, signs, guiderail, accident locations and more. There is only one photolog viewer and one set of film per Region. The viewer is usually located at the regional office and must be shared among many users. This severely restricts access to the photolog, particularly for residency-based users and the public. Color prints can be made, but it takes two weeks for printing. Also, long projects can require many prints (e.g., 200 prints for a two mile project), which can be awkward to use.

Desired State: Use existing technology to create fast, widespread access at the main office, regions and residencies to the photolog system through digitization of the 35mm photolog film and electronic access. Access at the main office and regions will be through a server, and through CD's containing county specific files for the residencies. Image files will be distributed to the regions through portable external hard drives.

Team Leader: E. John Lewis

Team: Rick Bennett, Ralph Hopkins, Robert Powell, Stephen Lester

Specific Goals for SFY 02-03:

1. Continue scanning the latest cycle of photolog film (currently 30 % complete)
2. Prepare RFP for digital camera, storage and processing system for direct digital capture.
3. Obtain the necessary equipment, complete training and transition the program to a fully digital system.

Rationale: Any user, including Executives, Regional Directors, designers, managers and field supervisors, should be able to view the image of a road segment and other related information from their desktop computer. This increased access to already existing information will save considerable field travel, provide more comprehensive consideration of field conditions in project selection, scoping and design, provide visual access to site conditions by managers and executives responding to complaints or inquiries, and more.

Technical Services Division

GOAL STATEMENT

Goal Name: 02-6 Highway Data Management System (Phase II)

As Is: It was demonstrated through Phase I of this project that there is a need to update our current system. DOT currently relies on mainframe based processes that have become outdated. Phase II will provide a working application that will be expandable for future needs.

Desired State: To implement a networked Client-Server information system that was proposed with the work done in Operational Goal #01-6 through contract #C012541. The intent is to deploy a "relational database" information system to support the collection, processing, and analysis of our highway data. It would include all the tools necessary to collect, maintain, and summarize the data to verify its integrity and accuracy. Training of staff will also be included in this goal.

Team Leader: Jim Cerqua

Team: Michael Fay, Rick Bennett, Allen Pooler, Bernie Schatz, Todd Westhuis

Specific Goal for SFY 02-03: To complete execution of an agreement, initiate and complete Phase II (design, test, and deploy database application) and solicit approval/funding to proceed with Phase III (system support and enhancement) of the project.

Rationale: Management will have more accessible, accurate and timely information on which they can make capital project decisions. Information from this infrastructure data will also be more accessible by numerous NYSDOT, Federal, and local governmental program areas, increasing the benefit derived from the ongoing data maintenance investment.

NOTE: Phase I of this project was completed in February 2002. This same month, the IT Council granted approval to Phase II of the project.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-7 Revision of the Transportation Research & Development Bureau's Policy & Procedures Manual, Research Oversight Functions.

As Is: Recently the Department's executive management initiated restructuring of research oversight functions. The Resource & Risk Management Bureau will assume oversight of the SPR funds (SPR I) and will provide general oversight of contract research projects conducted through TIRC, UTRC, and NYSERDA. The Bureau's existing Policies & Procedures Manual does not reflect the current collaborative arrangement between the Transportation Research & Development Bureau and the Resource & Risk Management Bureau. It lacks the mechanism needed to coordinate the functions of both bureaus.

Desired Status: A revised policy and procedures document that establishes the roles and functions of the Transportation Research & Development Bureau, and that accurately reflects the Bureau's new role. The document will define how the two Bureaus will collaborate to carry out the research program. It will provide detailed procedures for coordinating the functions of both Bureaus so as to avoid confusion and overlap, and ensure the program is carried out in the most effective and efficient manner.

Team Leader: Sreenivas Alampalli, Richard Albertin

Team: Ossama A. Elrahman, Paul Hoole

Specific Goal For SFY 02-03: Develop a revised Bureau Policy & Procedures Manual that clearly articulates the Bureau's role in conducting research and organize research coordination functions with the Resource & Risk Management Bureau.

Rationale: The recent restructuring of research functions dictates the revision of policies & procedures. Procedures for conducting research must undergo some changes to accommodate the separation of research functions between the Transportation Research & Development Bureau and the Resource & Risk Management Bureau. Definitions and categorization of engineering and non-engineering research needs to be added to the manual. Roles and responsibilities of each bureau must be clearly articulated to avoid confusion. A more detailed and specific description of procedures for the conduct of contract research for which Resource & Risk Management will take the lead, needs to be included. The new manual would revise program development procedures and responsibilities for research program approval and solicitation, to reflect the new changes.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-8 Precast Concrete QC/QA (Implementation Phase)

As Is: This is the continued implementation phase for the precast concrete QC/QA program. Implementation was commenced in 2000 and 2001 with the final acceptance of the QC/QA program set for January, 2002. Considerable progress was made during 2001 however, a lack of resources caused delays in final implementation. Progress to date includes specification revisions, Quality Control plan reviews, and inspector training and certification to meet the requirements of the program. The QC/QA based acceptance procedure for precast concrete products was completed by a joint Department/Industry Task Force. The next phase of work will focus on the implementation of the new procedure. Many industry members are progressing with implementation.

The quality assurance procedures for precast concrete vary between products. Some procedures rely heavily on manufacturer's quality control while others rely mostly on sampling, testing, and inspection by Department resident plant inspectors. For a considerable number of precast items, the precaster prepares shop drawings in accordance with the contract documents to clearly identify the fabrication requirements. The Department has the responsibility for reviewing and approving these shop drawings. This has the potential to delay project schedules.

Desired Status: Utilize quality control by the manufacture and quality assurance by the Department for assuring acceptable quality in precast concrete units to the extent that is reasonable.

Team Leader: Jim Reidy, M.O. Materials Bureau

Specific Goal For SFY 02-03: Specific goals for the current fiscal year include:

- Specification revisions for precast items to conform to the precast concrete acceptance procedure.
- Complete reviews of Quality Control Plans from all precast concrete producers.
- Train and certify Department representatives to meet the quality assurance inspection requirements of the QC/QA program.
- Full implementation of the precast acceptance procedure(s).
- Development of a shop drawing certification program for standard items.

Rationale: The use of precast concrete products by contractors has increased significantly during the past decade and will continue in the foreseeable future. This increased use has placed a much higher demand for review of shop drawings and for inspectors to cover the manufacturing operations under the standard quality assurance programs. The QC/QA process will be a more effective method for assuring acceptable quality of precast concrete products, while a shop drawing certification program will provide for more timely processing of drawings.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-9 Develop a Ride Quality Specification for Hot Mix Asphalt Pavements

As Is: The Department has no ride quality specifications for hot mix asphalt pavements. Currently the State ranks 48th in ride quality.

Desired State: Develop a specification that results in consistently improved ride quality for hot mix asphalt pavements.

Team Leader: Brad Allen, M.O. Materials Bureau

Team: Chad Corbett, M.O. Materials Bureau, Regional representation, Construction Division representation, AGC representation, FHWA representation.

Specific Goals for SFY 02-03: Benchmark existing practices and technologies in this area. Develop a ride quality specification and associated guidance and support documents for hot mix asphalt pavements.

Rationale: National studies have shown that improved ride quality results in improved pavement performance and lower operating cost for the motoring public.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-10 Pavement Marking Material Guidelines

As Is: Current information regarding available pavement marking materials, pavement compatibility, service life, cost, application and inspection criteria is found in various specifications, Engineering Instructions, Engineering Bulletins, and in the personal expertise of persons in the Regions and Main Office who have dealt with these materials.

Desired State: Produce a manual to assist Regional personnel in the selection and application of the various pavement marking materials available.

Team Leader: Orlando Picozzi, M.O. Materials Bureau

Team: Harry Sloan, M.O. Materials Bureau, Pat Galarza, M.O. Materials Bureau

Specific Goal: For SFY 02-03 Specific goal for the current fiscal year:

- Produce a comprehensive manual that describes each pavement marking material, references the specifications related to its application, and outlines characteristics such as compatibility, cost, etc.

Rationale: The current state of the art/state of the practice regarding these materials is not located in one, easily accessible location. In addition, some of the relevant information is in the form of 'corporate memory' in the minds of staff who have had direct experience with the application of these materials or with field evaluations. This up-to-date manual would spread the knowledge base throughout the Department for the benefit of designers, applicators, Construction inspectors, and managers.

Technical Services Division
GOAL STATEMENT

Goal Name: 02-11 Revise the Bureau's Quality Assurance Program to optimize the use of laboratory and staff resources while continuing to satisfy FHWA requirements.

As Is: The Department's current quality assurance program for materials is founded on dozens of outdated materials methods and procedures. While still effective, these procedures may not incorporate the latest quality assurance tools. Moreover, over time the level of effort associated with the quality assurance of some materials has evolved to far exceed the risk of failure of these materials, while in other instances the level of effort is not adequate. Finally, because these procedures have been developed over a long period of time, by several different employees to meet various needs and incorporate various tools, they are not always consistent.

Desired State: A materials quality assurance program, that is consistent and where quality assurance actions and resources are commensurate with the risk of failure.

Team Leader: Ken Clements, M.O. Materials Bureau

Team: Ken Clements, Kurt Matias, Rosemary Mahoney, William Koniowka, (One of the three Engineering Section Heads)

Specific Goal: Modify the Bureau's current business practices to accommodate new resource levels, new quality assurance tools and new operational issues related to the move to Wolf Road and assure continued operation of the Bureau's quality assurance programs for materials.

Rationale: Providing a quality assurance program for materials incorporated into Department projects is one of the Materials Bureau's core business activities. This program is necessary to insure that the materials used on Department projects conform to appropriate specifications and to protect the multi-billion dollar investment in the transportation infrastructure.

APPENDIX B

Threats and Opportunities for Technical Services - 2002

THREATS:

Wolf Road Move - The Department's planned move to Wolf Road next year will pose a threat to the Division's operation. Four laboratory sections will remain on campus while the remainder of the Division moves to Wolf Road. Maintaining a Division in two different physical locations will create operational inefficiencies to supervisors and managers in both locations. Segregating engineering and laboratory personnel, as well as remote storage of supplies, equipment, and vehicles, along with shuttling between the two areas will require new solutions to difficult challenges.

Recruitment - The current fiscal climate has nearly eliminated the opportunity to hire entry level positions, resulting in shortages in personnel which may jeopardize the Division's ability to perform basic core functions like lab testing. While the Division is not looking to increase staff beyond approved target levels, it does need to be able to maintain these levels in order to provide the Department with timely technical services. The short-term success of the Division and by extension the long-term success of the Department will depend on our ability to hire and train entry level technicians and engineers in numbers sufficient to support the Division's mission.

OPPORTUNITIES:

Non-Destructive Testing Technology - The Division has recently obtained on loan from FHWA, a high resolution thermographic imaging camera. Thermographic imaging is an important non-destructive testing (NDT) tool for construction evaluations, especially for the inspection of fiber reinforced polymer (FRP) bridge applications. Thermographic imaging can detect delaminations between unbounded layers of FRP. Through the implementation of this technology, the Division greatly enhances its NDT capabilities to help support the Department's initiative to build longer lasting bridges using FRP.

Process Review - As threats are identified and Division goals are developed to address them, our ongoing internal "process review" efforts offer opportunities for reviewing our routine business practices. The Division is currently reviewing quality assurance practices in several areas, with the goal of streamlining approval processes or eliminating activities which pose the least risk to Department objectives. In the short term, these reviews may help alleviate problems caused by staff shortages, while in the long run improve our organizational efficiency by reducing or eliminating marginally beneficial activities. This type of internal process review is on-going and is documented in Appendix A by the goals established in our annual Operational Plan.

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